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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,547	07/30/2003	Patrick A. C. Gane	239126US0CONT	6504

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EXAMINER

CORDRAY, DENNIS R

ART UNIT PAPER NUMBER

1731

DATE MAILED: 09/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/629,547

Applicant(s)

GANE ET AL.

Examiner

Dennis Cordray

Art Unit

1731

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 16-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 16-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 09/857217.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 8-11, 13, 17, 19, 21-29, 33, 43, 46 and 48 are rejected under 35 U.S.C. 103(a) as unpatentable over Plumstead (2178606) in view of Brown (5676746) and further in view of Shibazaki et al (4175066).

Plumstead discloses a process for treating sludge left over from treating dolomite to produce a filler or pigment for the manufacture of paper (p 1, col 1, lines 1-16). The sludge contains calcium carbonate and magnesium carbonate from the natural source of dolomite or from the calcinations of the dolomite (p 1, col 1, lines 30-45). The process includes steps of bubbling CO₂ through an aqueous suspension of the sludge and adding an acid such as sulfuric or sulfurous acid (p 1, col 2, lines 44-55 and p 2, col 1, lines 1-2). The steps may be performed in any order (p 2, col 1, lines 58-60). The CO₂ can be from pure sources, from waste sources, or be generated from the addition of the acid (p 1, col 2, lines 48-55 and p 2, col 1, line 1). The treatment can be performed prior to or with addition of a paper stock (p 1, col 2, lines 20-32; p 2, col 1, lines 44-48). A base can be added to raise pH if the sludge is acidic (p 2, col 2, lines 3-6). The product can be used in papermaking process by combining it with wood pulps (p 2, col 2, lines 55-58). A paper is produced using the product (p 4, col 1, lines 71-74).

Art Unit: 1731

Plumstead does not explicitly disclose untreated natural calcium carbonate as a starting material for the acid and CO₂ treatment. Plumstead also does not disclose a dispersant.

Brown teaches that known calcium carbonate fillers include precipitated calcium carbonate (PCC) in scalenohedral or rhombohedral form and ground natural calcium carbonate in rhombohedral form (col 2, line 35 to col 3, line 40). Of these, the scalenohedral form of PCC increases the bulk of the paper (col 2, lines 64-65) while the two rhombohedral forms do not (col 3, lines 15-17 and 34-40). Brown also teaches that dispersants are typically added to the mineral suspensions of the fine particle size fillers (col 3, lines 28-31) and recites a dispersant for natural or precipitated calcium carbonate of a polymer or copolymer of acrylic acid, methacrylic acid or other carboxylic acid or sulfonic acid containing vinyl monomer (col 10, lines 57-60). Shibazaki et al teaches that, when calcium carbonate is used in an aqueous medium, it is required that the particles have good dispersability and flowability if used for coating materials. Shibazaki discloses a dispersant of an acrylic acid/maleic acid copolymer that provides a high concentration of particles and a low viscosity (col 1, lines 5-9 and 27-44).

The art of Plumstead, Brown and Shibazaki et al is analogous as pertaining to the use of calcium carbonate in papermaking processes. Brown teaches that the rhombohedral forms of calcium carbonate have similar bulking properties in paper and that the scalenohedral form adds bulk. It would have been obvious to one of ordinary skill in the art to expect a bulk-enhancing treatment to natural calcium carbonate would have similar effects on natural calcium carbonate and PCC with the same structural

Art Unit: 1731

(rhombohedral) form. It would also have been obvious to try the process on PCC with the scalenohedral form with a reasonable expectation of success in further enhancing the bulking properties thereof. The product of Plumstead is made similarly to a precipitated calcium carbonate. Since the product of Plumstead is functionally similar to the claimed composition (calcium carbonate, H_3O^+ ion provider, CO_2 , and reaction products thereof), it would have been obvious to expect the pH of the suspension to fall within the claimed range and for a paper treated with the product to have the claimed weight properties in the process of Plumstead in view of Brown and further in view of Shibazaki et al. It would also have been obvious to use a polymeric dispersant in the process to keep the particles dispersed and to maintain a low viscosity.

Claims 1-3, 5-6, 8-13, 16-17, 19-25 and 28-29 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Shibazaki et al (4244933) in view of Brown and further in view of Shibazaki et al ('066).

Shibazaki et al ('933) discloses a process for precipitating calcium carbonate particles by treating an aqueous suspension of calcium hydroxide with CO_2 in the presence of phosphoric acid (col 2, lines 32-52). The process involves a first step of partially converting the calcium hydroxide to calcium carbonate using CO_2 in the presence of phosphoric acid. In a second step, the product of the first step is again treated with CO_2 in the presence of phosphoric acid to produce more carbonate. In a third step, the product of the second step is again treated with CO_2 in the presence of

Art Unit: 1731

phosphoric acid to produce even more carbonate (cols 5 and 6). Additional phosphoric acid can be added in the second step (col 6, lines 33-41). The products of the first, second and third steps thus contain calcium carbonate, phosphoric acid and CO₂ as well as reaction products thereof, making a similar, if not identical composition as that of the instant invention. Since no chemical difference was indicated in the instant specification, there is no disclosed difference between using natural and synthetic calcium carbonate as far as the effects on the paper treated therewith. Shibazaki et al ('933) recite examples of fillers made that have particle sizes from 1-2 μm and surface areas from 10-17 m^2/gm , which values lie within the claimed values (col 16, Table 11-1). Temperatures used were between 30 and 60 °C (cols 9-10, Examples 1-3). Shibazaki et al ('933) discloses a paper coated with the pigment composition (col 13, Reference Example 1). Since the composition is similar to that of the instant invention, the pH of the suspension would inherently be within the claimed range and the paper treated with the composition would inherently have the claimed weight properties.

Shibazaki et al ('933) does not explicitly disclose natural calcium carbonate in the process. Shibazaki et al ('933) also does not disclose a dispersant.

Brown teaches that known calcium carbonate fillers include precipitated calcium carbonate (PCC) in scalenohedral or rhombohedral form and ground natural calcium carbonate in rhombohedral form (col 2, line 35 to col 3, line 40). Of these, the scalenohedral form of PCC increases the bulk of the paper while the two rhombohedral forms do not. Brown also teaches that dispersants are typically added to the mineral suspensions of the fine particle size fillers (col 3, lines 28-31; col 10, lines 57-59).

Art Unit: 1731

Shibazaki et al ('066) teaches that, when calcium carbonate is used in an aqueous medium, it is required that the particles have good dispersability and flowability if used for coating materials. Shibazaki et al ('066) discloses a dispersant of an acrylic acid/maleic acid copolymer that provides a high concentration of particles and a low viscosity (col 1, lines 5-9 and 27-44).

The art of Shibazaki et al ('933), Brown and Shibazaki et al ('066) is analogous as pertaining to the use of calcium carbonate in papermaking processes. Brown teaches that the rhombohedral forms of calcium carbonate have similar bulking properties in paper and the scalenohedral form adds bulk. It would have been obvious to one of ordinary skill in the art to expect a bulk-enhancing treatment to natural calcium carbonate would have similar effects on natural calcium carbonate and PCC with the same structural (rhombohedral) form. It would also have been obvious to try the process on PCC with the scalenohedral form with a reasonable expectation of success in further enhancing the bulking properties thereof. The product of Shibazaki et al ('933) is a precipitated calcium carbonate. Since the product of Shibazaki et al ('933) is functionally similar to the claimed composition (calcium carbonate, H_3O^+ ion provider, CO_2 , and reaction products thereof), it would have been obvious to expect the pH of the suspension to fall within the claimed range and for a paper treated with the product to have the claimed weight properties in the process of Shibazaki et al ('933) in view of Brown and further in view of Shibazaki et al ('066). It would also have been obvious to use a polymeric dispersant in the process to keep the particles dispersed and to maintain a low viscosity.

Claims 20, 30, 32-36, 47, 49-51 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plumstead or Shibazaki et al ('933) in view of Brown and further in view of Shibazaki et al ('066).

Plumstead and Shizubaki et al ('933) do not disclose that the pigment or filler can be added to the thin stock or the thick stock or that paper can be made using synthetic fibers. Plumstead and Shizubaki et al ('933) further do not disclose that paper made using the pigment or filler can be used for printing.

Brown discloses a filler or coating for paper comprising a slurry of calcium carbonate particles, either from natural or synthetic sources (col 7, lines 2-5, 13-19. A dispersant is added (col 10, lines 57-60). The material is used as a filler or as a coating for paper (col 14, lines 21-32). The treated paper has increased bulk and enhanced printing properties (Abstract). Brown discloses that it is known to use dolomite, calcium carbonate, kaolin, talc and titanium oxide as fillers and pigments in papermaking (col 1, lines 11-15). Brown further discloses that

The instant disclosure teaches that a specialist in the field would know that papers can be made using wood fibers (such as resinous or deciduous wood) or synthetic fibers (non-wood), fillers and water. The instant disclosure also teaches that the process includes a diluting a thick stock to make a thin stock. The stock containing filler is drained on a wire and the medium that is drained off contains a portion of the filler and is called a white liquor. The instant disclosure teaches that a formed sheet is

coated and that some loss of coating color and coated paper occurs, the lost paper being recycled as a mass filler (pp 1-2).

The art of Plumstead, Shizubaki et al ('933), Brown and the instant invention are analogous in that they pertain to filled and/or coated paper. It would also have been obvious to use either wood fibers or synthetic fibers to make the paper of Plumstead or Shizubaki et al ('933) in view of Brown and further in view of Shibazaki et al ('066) as functional equivalents. It would also have been obvious to add the pigment or filler to a thin or thick stock as a standard process for manufacturing paper. It would have been obvious to use the coated and/or filled paper for printing using conventional digital printing machines.

Claims 18 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plumstead or Shizubaki et al ('933) in view of Strauch et al (4767464).

Plumstead and Shizubaki et al ('933) do not disclose that the natural carbonate sources include marble, calcite or chalk.

Strauch et al discloses sources of natural calcium carbonate fillers including chalk and marble (col 7, lines 3-36).

The art of Plumstead, Shizubaki et al ('933), Strauch et al and the instant invention are analogous in that they pertain to filled and/or coated paper. It would have been obvious to one skilled in the art at the time of the invention to obtain calcium carbonate from chalk or marble for the filler of Plumstead or Shizubaki et al ('933) in view of Strauch as functionally equivalent and readily available sources.

Allowable Subject Matter

Claims 4, 7, 31, 38-42, 44-45 and 52 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 4 and 38: The previous art that comprises acid and CO₂ treatment of carbonates discloses only small quantities of acid in the process, (i.e.- less than 5 percent of the amount of calcium hydroxide, which would amount to less than 5 percent of the amount of calcium carbonate). The use of larger relative amounts of acid is not anticipated or suggested by prior art.

Claims 7 and 39-41: The calcium carbonate particles made by the nearest previous art have a much lower surface area than the preferred range indicated in the instant claims, thus do not anticipate or make obvious particles of higher surface area.

Claims 42 and 44-45: The very specific conditions used to prepare the fillers of the instant invention are neither disclosed or made obvious by the processes of the nearest prior art.

Claims 31 and 52: While there is a large body of prior art dealing with calcium carbonate fillers and a large body of art dealing with recycling white liquor and broke, the filler compositions are added to the new stock and not the recycle streams. The recycle streams contain fillers lost during the draining and forming process but new filler compositions are not added to these streams prior to their combination with the new stock. Thus the prior art does not suggest adding new filler compositions to the recycle streams alone.

Response to Arguments

Applicant's arguments, see pp 14-16, filed 7/06/2006, with respect to the rejections of claims under 35 U.S.C. 102(b) or 35 U.S.C. 103(a) over Plumstead or Shibazaki et al ('933) have been fully considered and are persuasive. Neither reference alone explicitly discloses or suggests using a natural calcium carbonate. Therefore, the rejections have been withdrawn, as well as the remaining rejections under 35 U.S.C. 103(a) that were in part based upon them. However, upon further consideration, a new ground of rejection is made as detailed above.

Applicants argue that the use of a synthetic or precipitated calcium carbonate, treated in the manner of the instant invention, fails to result in increased paper bulk. However, applicants have merely argued that other forms of calcium carbonate, similarly treated, would not increase the bulk of paper. No comparative data have been presented. Although Applicants state on p 15, 1st par that an inventor's declaration will be submitted in support of the argument, no such Declaration has been received. In view of the teachings of Brown (col 2, line 35 to col 3, line 40) that natural calcium carbonate and some forms of PCC have the same crystal structure (rhombohedral) as well as the same functional effects on paper (little or no increase in bulk), one of ordinary skill in the art would expect a treatment that would change the bulk enhancing properties of one to have a similar effect on the other. Furthermore, similar treatment of the other form of PCC (scalenohedral) might be expected to increase the already existing bulk enhancing property, or at least it would have been obvious to try the

Art Unit: 1731

treatment with a reasonable expectation of success. Thus, it would have been obvious to one of ordinary skill in the art to obtain the claimed properties using any source of calcium carbonate, including PCC or synthetic calcium carbonate, as a functional equivalent, or at least to try any source of calcium carbonate and have a reasonable expectation of success.

Applicant argues on p 16 that the "dispersant" polymer of Brown causes aggregation of the mineral rather than stabilizing the rheology. The dispersant polymer of Brown is separate from the aggregating polymer and is used with the high solids feed slurry having at least 30% by weight of particles having an equivalent spherical diameter of less than microns (col 10, lines 57-65; col 11, lines 8-12). The slurry is diluted to a solids content to between 0.1 and 30%, following which a low molecular weight polymer is added to aggregate the particles (col 11, lines 39-50). The dilution step must precede the addition of the low molecular weight polymer (col 11, lines 45-47), thus the dispersant polymer and the low molecular weight polymer must be different polymers. The use of the dispersant polymer allows a high concentration of particles and still maintains a low viscosity (stabilizes the rheology) as taught by Shibazaki et al ('066) (col 1, lines 5-9 and 27-44).

Applicant argues on pp 16-17 that the Strauch reference pertains to precipitated calcium carbonate. The reference was only used to teach additional sources of natural calcium carbonate as known in the art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Cordray whose telephone number is 571-272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


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